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THE NEW STAR IN *NORMA*.

By W. W. Campbell.

Attention was called in these *Publications* (Vol. V., page 225, Vol. VI., pages 52–54), to the discovery of a new star of the 7th magnitude in the constellation *Norma*. It was found by means of its peculiar spectrum recorded on a photograph of that part of the sky, made July 10, 1893, by the Harvard College observers at Arequipa, Peru. The actual discovery was not made till late in October, when the plate was examined by Mrs. Fleming at Cambridge, Mass. By that time the Sun was near the region of the *Nova*, and, probably for that reason, no other spectrum photographs were obtained. But the original negative sufficed to establish the extremely interesting fact that its spectrum was essentially identical with the spectrum of *Nova Aurigæ* in February, 1892.

The Declination of the new star is south 50° 14′, and the latitude of Mount Hamilton is north 37° 20′; so that the true altitude of the star when on our meridian is only 2° 26′. Any observations secured here could only be successful to a very limited degree.

The *Nova* first came into accessible position in February. It was found, without difficulty, the morning of February 14. Its light was estimated at one-fifth or one-sixth that of the adjacent 8th magnitude star, Cordoba *General Catalogue*, 20940. The *Nova* would therefore be of the 9½ or 10th magnitude.

Its spectrum consisted of an exceedingly faint continuous part in the yellow and green, and four bright lines apparently identical in position and relative intensity with the bright lines at wave-lengths 501, 496, 486, 575 in the August, 1892, spectrum of *Nova Aurigæ*. Rough measures of the wave-lengths of the brightest two lines, made after daylight, gave 5013 and 4953. While the measures were not satisfactorily made, there was no doubt that the spectrum was that of a planetary nebula. The star has been seen on four subsequent mornings. Its magnitude has undergone no appreciable change. Fairly satisfactory measures of the brightest three lines give as their wave-lengths, 5007.3, 4957, 4860. The latter is the hydrogen Hβ line, whose normal position is at 4861.5. The normal positions of the first two lines in the well-known nebulæ, according to Dr. Keeler's

1890 observations, are 5007.0 and 4959. The line in the yellow is too faint for measurement. The lines are broad, as in the spectrum of *Nova Aurigæ.* More accurate measures than the above cannot be made here, and subsequent observations will be confined to noting any possible variations in brightness.

Both *Nova Aurigæ* and *Nova Normæ* at discovery possessed substantially identical spectra of bright and dark lines. Both diminished in brightness and both assumed the nebular type of spectrum. The new star of 1876 in the constellation *Cygnus* probably had an identical history: passing from a bright star with a spectrum of bright and dark lines, to a faint star with a spectrum in which only one bright line was seen (probably the bright nebular line at 5007). We cannot say just what the significance of two or three "new stars" with identical histories will be, but it will be great. Only five new stars have been discovered since the application of the spectroscope to astronomical investigation, and that three of these should have similar spectroscopic histories is a remarkable fact, and an encouraging fact to students of these most interesting objects.

AN EXPLANATION OF THE BRIGHT PROJECTIONS OBSERVED ON THE TERMINATOR OF *MARS.*

By W. W Campbell.

An extremely favorable opposition of *Mars* is rapidly approaching. Useful observations can probably begin in June and continue into the year 1895. It is known that many astronomers are preparing to expend a great deal of energy upon that planet, and are expecting more valuable results than have been obtained at any previous opposition. We shall undoubtedly have interesting accounts of the progress of their work, both in the scientific journals and in the public press, which everyone, astronomers included, will welcome. It is, unfortunately, perfectly safe to predict that we shall also hear from the sensationalists, astronomers included; and that fact is a source of sincere regret to all healthy minds.

Nearly all the problems concerning *Mars* are still awaiting solution. It is difficult to mention any, indeed, except some of those relating to the polar caps, that have been solved